The Week In Engineering and Construction

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TVA starts construction of $30,000,000 Douglas dam

Project is expected to produce 100,000-kw.; is ninth of program for increased power production; engineers look for dam closing in year.

The vanguard of an eventual force of more than 5,000 workers have moved into the valley of the French Broad River in Tennessee to begin work on the Tennessee Valley Authority's $30,000,000 Douglas Dam.

President Roosevelt's signature this week on a bill authorizing an appropriation for the work spurred TVA's workers to begin a race with time to put the dam—ninth such project to provide maximum power capacity for war work—into operation. TVA engineers hope to be able to close the 150-ft. high, 760-ft. long dam in time to impound next winter's rainfall. Eventually, the project will produce almost 100,000 kw. of power.

In addition to the emergency program, TVA is just finishing or has underway three of the dams in its regular program and is building the 240,000 kw. Watts Bar steam plant. These, together with additional generators at existing dams made possible by improved regulation of the river, will bring installed capacity of the TVA system late in 1944 to more than 2,700,000 kw.—more than twice the 1,064,000-kw. capacity of last June. Cost of the program runs well over $2,000,000.

Money for Douglas Dam is included in the fourth supplemental defense appropriations; the balance consists of $12,525,872,000 for expansion of the Air Corps. It includes $933,000,000 asked by the President (*ENR*, Jan. 22, p. 145) for expansion of plane manufacturing capacity.

At the beginning of the emergency, in 1940, TVA had underway three dams. Biggest was the $105,000,000 Kentucky Dam, built to provide 160,000 kw. on completion in 1944. Fort Loudoun Dam, costing $44,000,000 and providing 128,000 kw., is scheduled for completion in the Spring of next year. Now being finished is Watts Bar Dam—providing 150,000 kw. at a cost of $35,900,000.

First of the emergency jobs was Cherokee Dam, started in the Summer of 1940. This $31,500,000 project, closed early this month, will provide 90,000 kw. Two 60,000-kw. generating units at Watts Bar steam plant will be put into operation next month.

In June 1941, construction on four dams were started on the Hiwassee River, to be built at a total of $36,800,000. Two of these—Chatuge and Noteley—are due for closure next month. The other two—Apalachia and Ocoee No. 3—will be closed in December. Taking into account the increased generation down-stream resulting from their construction, these dams will furnish an additional 210,000 kw. to the capacity of the TVA system.

Last fall, Congress was requested to provide money for the Fontana Dam project on the Little Tennessee River, the two remaining units at Watts Bar steam plant, and Douglas Dam. Fontana, a site taken over from the Aluminum Co. will provide 200,000 kw. at a cost of $48,000,000. Storage of water will start in 1944 and power production in 1945.

Douglas Dam on the French Broad River is particularly desired by the administration because it will provide power—by regulation of the river—as soon as it is closed. Power production in 1943 would amount to some 90–100,000 kw.

To house twelve hundred defense workers

One of the largest defense housing projects to be erected in the New York metropolitan area through private financing has been planned by the Equitable Life Assurance Society. The development will be known as "Clinton Hill," and will be erected on a site adjacent to the property of the Brooklyn Navy Yard, at Brooklyn, N. Y. Approximate cost is $7,000,000.

Eleven apartment buildings of reinforced concrete construction ranging in height from 10 to 14 stories, will provide accommodations for about 1,200 defense workers and their families. Two store and restaurant groups are included in the plans. About one-third of the site area will be devoted to buildings. Layout of part of the project is shown above.

Contracts were let last month and construction is now under way. Starrett Bros. & Eken, Inc. hold the general construction contract, and J. Di Stasio & Co. are consulting structural engineers. Harrison, Fouilhoux and Abramovitz are architects.

becoming available at a time when the power situation is expected to be tightest. There was strong local objection to the flooding of valuable farm land and resultant interference with the local canning industry; consequently, Congress turned it down and approved instead two other projects on the Holston River. Watauga Dam, costing $25,000,000 and providing 60,000 kw., and South Holston, providing 75,000 kw. at a cost of $23,000,000, will be closed in the Spring of 1944, but it is feared they will miss the Spring floods and not deliver power until 1945.

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FWA standardizes defense housing plans

Approximately 25 standardized plans for defense homes, including pre-fabricated dwellings, have been recommended by a special committee on defense housing and adopted by the Federal Works Agency according to an announcement by assistant administrator Baird Snyder, III, acting for administrator Philip B. Fleming.

The plans are for two geographical areas—northern and southern United States. They provide for one, two, three and four bedroom units, in one- and two-story sites, including detached, twin and group houses. They will be made available to architects and housing authorities engaged in building the more than 70,000 homes for war workers, authorized under the recently amended Lanham Act, which provides $300,000,000 for this purpose. Plans will be supplemented and revised from time to time.

In addition to basic plans, the FWA will make available to architects a 4-in. modular system with each, designed to assist builders engaged in pre-fabricated housing, especially site pre-fabrication.

These plans have not been scheduled for use in connection with the 42,000 demountable housing program (*ENR*, Jan. 29, p. 166). Contracts for the purchase of these dwellings are being negotiated with pre-fabricators, lumber mills and woodworking plants.

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Off-peak water pumping can conserve power

By taking advantage of elevated tank or other storage facilities, pumping at waterworks plants often can be restricted to off-peak power load hours, and thus conserve much needed power for war production. This suggestion comes from Milo Smith, Chicago Bridge & Iron Co., who points out an example at Dotham, Ala. Here the power company, industries and water officials conferred to work out a plan whereby the pumping would be done at times when the industrial power load was lightest.

Most waterworks pumping stations, particularly in connection with elevated storage tanks, automatically go into operation when the supply in the tank drops 3 or 4 ft. Thus, the pumps operate at frequent, though short, intervals throughout the day. Yet in many cases study will show that the storage will last through the day and the heavy industrial power load periods without drawing into the minimum fire reserves. In such cases pumping could be limited to nights or other times of light industrial power demand.

If storage is not of sufficient capacity to last a whole day, power can often be conserved by eliminating pumping in the peak hours of industrial demand. In many communities the power required for water pumping is a substantial share of the local power demand, and spreading of the power load will greatly aid war production.

Highest concrete arch dam in South America

What is believed to be the highest concrete arch dam in South America is being built about 15.5 miles from the town of Villa Dolores, in the Province of Cordoba in Argentina. The project is being carried out under the general direction of the hydraulic department of the province.

Known as Dique La Vina Dam, the structure when completed, will be about 344.5 ft. high, and is expected to produce annually 32,000,000 kw.-hr. of power by means of a 10,000-hp. installation. A storage reservoir of 185,500 acre-feet will provide water for irrigation purposes. About 223,000 cu. yd. of concrete will be required to complete the dam. The estimated cost of the project is $8,500,000, including machinery. Sollazzo Hermanos holds the construction contract.

Incendiary bomb film being distributed by OCD

The first film authorized for training purposes by the Office of Civilian Defense, entitled "Fighting the Fire Bomb," is now being distributed throughout the United States. It is accompanies by an instruction manual containing supplementary lectures, material for a quiz based on the film, and other instructional material. The film and manual constitute official training material has been proved by the Training Section of OCD.

Copies of the film are being made available to state and local defense councils through the Office of Civilian Defense, and prints of the film and copies of the manual may be purchased by individuals from Transfilm, Inc., 9 Rockefeller Plaza, New York City, or through OCD.

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How civilian engineers are being absorbed into nation's war effort

General Reybold hails capacity of free profession to outdistance "regimented" Nazi engineers

Utilization of the civilian civil engineer in our war effort by a process of integration, rather than by regimentation as practiced by the Germans, was declared to be the policy of the Corps of Engineers by Maj. Gen. Eugene Reybold, Chief of Engineers, in an address last week before the Washington Chapter of the American Society of Civil Engineers. Every effort is being made to transfer as much as possible of the war construction program to the shoulders of the private practicing engineers of the country. The home front or "zone of the interior" construction program, involving cantonments, airbases, airplane assembly plants, ordnance factories, supply depots and harbor facilities is "beyond the existing capacity of any governmental construction agency," said General Reybold, "but it is not beyond the capacity of the American engineering profession."

In commenting on the sound decentralized organization of the Corps of Engineers into "Engineer Divisions" and "Engineer Districts," which blanket the country, Gen. Reybold pointed out how this organization has always had a peacetime policy of supplementing the talents of its own engineers by employing private consultants, and that this policy has been broadened rather than abandoned under war conditions.

The problem of providing a number of "air depots" was used by General Reybold as an illustration. No one had ever heard of an air depot before, but there were some "type plans" for general supply and repair installations. A cost-plus-fixed-fee contract was negotiated with a private engineering firm to redesign a modern and comprehensive installation from these rough type plans. This design was then placed in the hands of several District Engineers who negotiated contracts with other engineering firms to adapt it to specific sites. General Reybold also emphasized that the same principle of "sharing our burdens with the country's engineering profession" is being applied to the actual construction work. A current aircraft assembly plant, for example, is being handled under an "architect-engineer-manager" type of contract in which a firm of private engineers draws plans and specifications, prepares the advertisements for construction contracts, draws the work schedule and inspects and supervises the construction.

In paying tribute to the invaluable work of professional engineers in the "zone of the interior," General Reybold also emphasized their role in combat units, pointing out that a typical engineer battalion might have three-fourths of its officers from the "Engineer Reserve."

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War demand for lumber unlikely to cause shortage

In the early weeks of this year the Corps of Engineers bought more than 700,000,000 board feet of lumber for construction of nine new cantonments and five tent camps, Col. W. D. Styer told the West Coast Lumberman's Association last week. "We anticipate," the Colonel said, "a great many more large projects of various types to be put under construction in the near future."

Nevertheless, with prudent handling, he believes, there should be enough lumber to meet all needs without rationing, including lend-lease shipments abroad.

The bulk of lumber production last year went for defense uses—23,730,000,000 board feet out of a total production of 32,600,000,000. Largest single buyer was the Army, which took 2,300,000,000 feet.

Atlanta expands its airport to meet increasing army demands

The Atlanta, Ga., municipal airport, formerly known as "Candler Field," about 8 miles south of the city, is being expanded to meet increasing demands for commercial planes, and to serve a U. S. Army reconnaissance squadron, and a private flying and pilot training school.

Plans for the original airport provided only two short runways. The expansion program will extend the east-west runway to 4,600 ft. and the northeast-southwest runway to 4,500 ft. A north-south runway 4,800 ft. long and a second new northeast-southwest runway 3,400 ft. long are being constructed; all extensions and new runways are to be built to a 150 ft. width.

Runway construction is being done by the soil-cement method. The natural soil is such that this method can be used to excellent advantage, both from the standpoint of rapid construction and that of economy. In the illustration above, farm equipment, consisting of two sets of double gang plows, one single bottom plow, a spring tooth cultivator with tractors, are shown preparing the soil preliminary to spreading of cement in the pulverized earth. When the operation is complete, the 6-in. cement base will be used as runways until summer when asphalt surfacing will be added.

The Atlanta airport is a municipal enterprise. However, funds for the new extension were supplied by WPA and the Civil Aeronautics Administration; the work is being done by WPA under a "rental of equipment" agreement by the Louis A. Byrne Contracting Co., Inc. Jack Gray is airport manager, H. Harvie Perkins is CAA engineer and Don G. Nichols is in charge for WPA. Total cost of the project is $700,000.

An article covering construction operations on this project will appear in a forthcoming issue of ENR.

Junior Branch of the society's metropolitan section was represented by, left to right, ENGENE QUIRICONI, the Ferber Co., GEO. HAYDEN, of the Portland Cement Association; MORRIS ATKIN, Phelps-Dodge Corp. (president of the Junior Branch); and FRANK ROGERS also of the Portland Cement Association.

Not MEN AT WORK

as seen at the smoker, held Jan. 22 at Manhattan Center in New York City during the annual Am. Soc. C.E. meeting.

Army camp sanitation experts SAM ELLSWORTH, consulting engineer, Boston, and PAUL HANSEN, consulting engineer, Chicago.

Beer and "vittles" for HARRY R. HALL, chief engineer of the Washington Suburban Sanitary District (Md.), and H. LLOYD NELSON, Eastern sales manager, U. S. Pipe & Foundry Co., Philadelphia.

Salami sandwich intrigues SAM BAXTER, assistant director of the Philadelphia Department of Public Works.

GEORGE SEABURY, left, secretary of the society, relaxed after having steered the convention through most of its sessions.

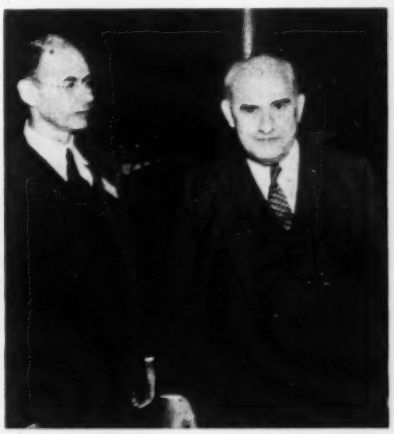
At near right is SAM MARSHALL, formerly chief engineer of the Pennsylvania Turnpike Commission and recently made a partner in the firm of Parsons, Klapp, Brinckerhoff and Douglas. A. Y. FREEMAN of Niagara Falls, New York is at extreme right.

Standing is HAL HALE, formerly city engineer of Knoxville, Tenn. and now assistant secretary of the Am. Soc. C. E. with offices in Washington. At left is NORMAN C. HILL of the New York City Transit Commission, and J. F. SANBORN, New York consultant.

Borough Works Commissioner of Manhattan, WALTER D. BINGER, left, is chairman of the society's committee on Protection of Civilians in War Time. At center is W. H. MUESER of Moran, Proctor, Freeman & Mueser, and at right, is CHARLES SPENCER of Spencer, White & Prentis Inc.

ENOCH NEEDLES, left, of Howard, Needles, Tammen & Bergendoff, talks over priorities difficulties with OLE SINGSTAD, chief engineer of the New York City Tunnel Authority.

VIN SMITH of Construction Methods getting the low-down on steel construction in the Pittsburgh area from GEO. S. RICHARDSON, consulting engineer of that city.



E. L. MacDONALD of the consulting firm of Parsons, Klapp, Brinckerhoff & Douglas, left, talks with Prof. HARDY CROSS of Yale University.

At left, A. TURNER MacDONALD, county highway engineer of Fulton County, Ga. learns of new structural development from T. RITCHIE EDMONSTON, structural engineer and estimator of Bethesda, Maryland.

Dean F. M. DAWSON of the College of Engineering, University of Iowa, (at right) sticks to coffee and sandwiches for refreshment.

Survey of building safety urged for designating air-raid safety zones

Am. Soc. C.E. committee says cities must determine safest structures in residential and business areas

One of the important recommendations for safety against aerial bombing contained in a report prepared by the Committee on Civilian Protection in Wartime of the New York Metropolitan Section, American Society of Civil Engineers, is to select and mark safe shelter zones in buildings. Recognizing that no place is safe against a direct hit by a heavy bomb, the committee urges that expert structural and architectural engineers be engaged to determine those places that are relatively safe against blast, fragments of glass and bomb splinters; and as supplementary to these surveys that city authorities determine the location of all buildings of relatively safe construction, in general those that are fireproof and of skeleton frame type.

The committee points out that most apartment houses six stories or less in height are of wall-bearing type and are therefore of doubtful safety as an air raid shelter. A narrow interior corridor in such buildings would offer some degree of protection since the short span framing could perhaps support a debris load in case the building collapsed. Narrow corridors in the basements are probably the best shelters in such buildings, and they may be reinforced with temporary struts and beams to support debris loads from above.

Apartment houses more than six stories high are probably fireproof, with steel or reinforced concrete frames and concrete floors. Interior rooms or hallways on any floor above the first and preferably above the second, but not in the top story, are relatively safe. Basement zones away from boiler rooms are also safe in this type of structure.

Old school buildings two or three stories in height are probably of wall bearing type and are absolutely unsafe. Modern school buildings of fireproof construction usually contain safe zones, but being only two or three stories in height, the zones should be located on the second floor or in the basement. However, even the top floor offers comparative safety if the roof is thick enough to resist incendiary bombs. The committee urges that all school buildings should be classified immediately by the responsible authorities.

In stores the front part of the building should be avoided because of the dangers of flying glass. The second floor is much better than the first.

Skyscraper buildings offer the safest refuge. Interior corridors above the second floor, basement zones away from the boiler room and interior stairways are safe places in such buildings. Every theatre is a special problem and this type of building should be classified by the authorities so that the audiences may know whether they are in a good, a medium, or a poor air raid shelter.

In one or two story frame houses, the basement is in general the safest place since it offers protection against bomb fragments. A narrow basement corridor not near the furnace is the safest location. A close bomb hit to an ordinary residence is quite certain to collapse it. If the basement ceiling beams are strong enough to support a debris load, loss of life may be averted.

The committee recommends that persons caught in a subway should stay there since there are many underground passages in the subway system of New York that are quite safe. Although they will not support direct hits, they will support a large debris load. Moreover, the subways offer safety against blast and fragmentation. Zones in subways that might be hazardous because of flooding or electric current dangers should be marked immediately.

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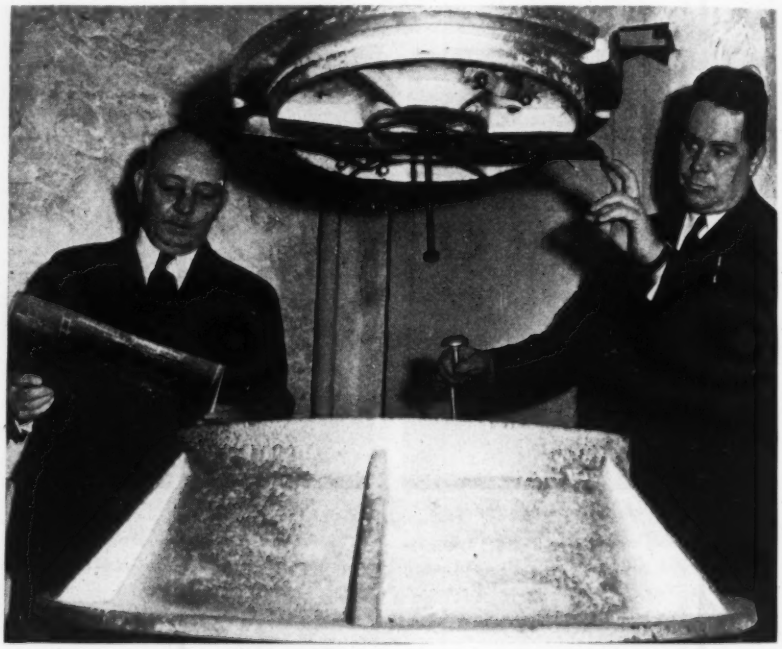
Denison Dam spillway bids will be advertised Feb. 15

Bids for construction of the spillway on the Texas side of the 150-ft. high abutment at Denison Dam will be advertised about Feb. 15, according to H. L. Johnson, engineer of the $50,000,000 flood-control power project.

In the Jan. 22 issue of *ENR*, it was stated that bids would be opened not later than Feb. 15, which was in error.



How to stop a manhole cover snatcher

Salvaging metal for the war effort is laudable, but to carry the idea so far as to pick up sewer manhole covers—well, that's another matter. And John J. Morris (right), sewer commissioner of Eastchester, N. Y., decided to do something about it when his and neighboring towns were victimized by patriotic but unscrupulous "junkies".

After several weeks of experimentation in his cellar workshop, during which he was aided and comforted by town councilman William Stohldreier, he perfected a device that prevents covers from being removed by unauthorized persons. As shown above, the device consists of two steel arms that ride on a bolt suspended from the center hole in the cover. Attached to toggle rods, the arms can be drawn to a horizontal position when the screw is turned, thus projecting them under the manhole frame and securing the cover. No one can turn the screw to unlock the cover unless he possesses a special key wrench that fits over the bolt.

Not only does the device prevent the theft of covers, reports Mr. Morris, but it stops them from rattling as well. And it may foil saboteurs who might be tempted to plant a bomb in a sewer.

FWA gets "go ahead" on demountable houses

The Federal Works Agency has been authorized to proceed immediately with the construction of 17,805 demountable houses in 15 defense localities. These houses will be the third and fourth groups to be built under the recent Presidential allocation of $153,000,000.

Location of the new houses, and number of family dwelling units at each location, are as follows:

Locality	Number of family units
Burns City, Ind.	250
Charleston, S. C.	2,410
Charlestown, Ind.-Louisville, Ky.	750
Choteau-Pryor, Okla.	500
Granite City-East St. Louis, Ill.	300
Hartford, Conn.	225
Higley, Ariz.	110
Little Rock, Ark.	600
Newport News-Yorktown, Va.	5,330
Roswell, N. Mex.	130
San Miguel-Paso Robles-Bradley (Camp Roberts), Calif.	150
Texarkana, Tex.-Ark.	500
Kingsbury-LaPorte, Ind.	3,150
Parsons, Kans.	400
Vallejo (Mare Island), Calif.	3,000

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First power released at Santee-Cooper Dam

Over the week-end of January 24, a switch was thrown at the Pinopolis power house, which started operation of the $57,000,000 hydro-electric Santee-Cooper power and navigation project, about 53 miles from Charleston, S. C. Designed primarily to supply cheap power, the project also provides a new water route between Charleston and Columbia, S. C. With an installed capacity of 173,000 hp., it is expected that about 700,000,000 kw.-hr. will be made available for defense industries in the area.

The Santee-Cooper project consists of Santee Dam, which includes 7.1 mi. of earth-fill and 3,400 ft. of concrete spillway on the Santee River; a diversion canal to the valley of the Cooper River; Pinopolis Dam, which is an earth-fill 2.5 mi. long, and the navigation locks and power house; many miles of earth dikes around the Pinopolis reservoir and a tailrace canal 4.5 mi. long to the Cooper River. (*ENR*, May 23, 1940, p. 706, and Nov. 14, 1940, p. 650). A lock 150 ft. wide and nearly 160 ft. high is capable of raising the river to a maximum height of 75 ft. for navigation purposes.

Work was begun on the project in 1939 but did not get into full swing until early in 1940. The project was built with federal funds by the South Carolina Public Service Authority. F. R. Sweeny was chief engineer. The Harza Engineering Co. was in charge of engineering work. Principal construction contracts were held by the Central Engineering Co.; W. C. Shepherd; Wilbanks & Pierce, Inc.; McCarthy Improvement Co.; C. G. Fuller and J. G. Britton; J. A. Terteling & Sons; and Virginia Bridge Co. Turbines and generators were built by the Newport News Shipbuilding & Drydock Co., Allis-Chalmers, Westinghouse and General Electric.

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Added water supply pledged for Martin plant

The city of Baltimore, the county of Baltimore, and the state of Maryland have pledged a total of $436,000 as their share of the cost of installing a new 36-in. water main to the Glenn L. Martin aircraft factory at Middle River, Baltimore.

As the result of a meeting held after army engineers reported that the two mains now serving the plant are not sufficient to supply adequate fire protection and to care for increased production at the plant, the city and state agreed to pay $93,000 each and the county $250,000 toward the cost of the project. The remainder of the cost—about $764,000—will be assumed by the Federal Works Agency, it was indicated.

The two mains now serving the plant are a 12- and a 16-in. pipe. With the new main, the plant will have the equivalent of a 40-in. main, carrying a pressure of 65 lb.

To remove Ripple Rock in Pacific Coast channel

A well-known British Columbia mining engineer, whose name Federal Department of Public Works officials decline to divulge, has submitted plans which he says will guarantee the removal of Ripple Rock, long considered a navigation hazard in the inside passage between Vancouver Island and the mainland. The plans call for sinking a shaft to a depth of 300 ft. and drilling of a submarine tunnel for 1,100 ft. to a point underneath the center of the rock. The tunnel would be filled with explosives and discharged, thus blowing out the rock.

British Columbia contractors declined to submit bids for removing the rock when tenders were called, believing the risk of loss was too great. The tenders closed at Ottawa on Dec. 23.

Next step proposed in the effort to remove the rock is a conference between public works officials, contractors and mining men to discuss the new plan.

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Dredging to start next month on St. Johns River

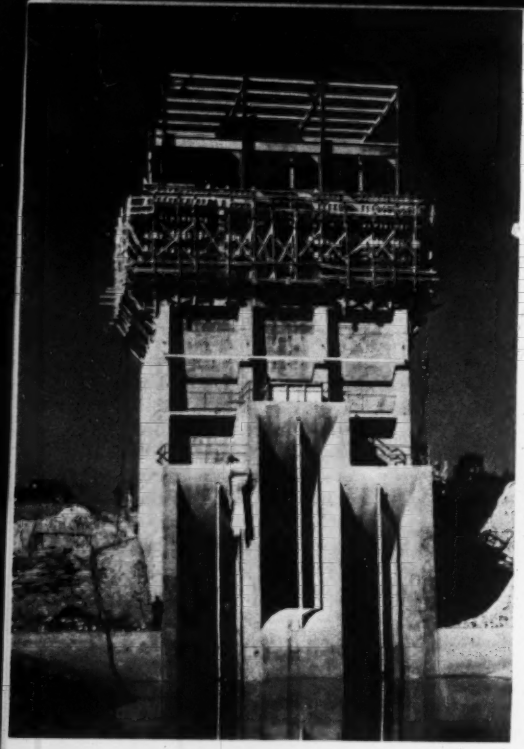
A 3,000,000 cu.yd. excavation job to be started next month will restore the St. Johns River channel at Jacksonville, Fla., to its authorized depth of 30 ft., according to Maj. A. G. Viney, U. S. district engineer.

The work was originally scheduled to be started last year but was delayed due to an accident to the contract dredge "Duplex", owned by the Sternberg Dredging Co. of St. Louis, Mo. The ladder on the dredge, an 80-ton steel frame that carries the suction pipes, was lost at sea during a storm off Miami.

Accumulated silt and shell have reduced the minimum depth of the channel to less than 28 ft. in some places. The initial work will be begun on an obstruction shoal near St. Charles Creek cut just below New Berlin, where the channel is now only 27 ft. deep.

Pinopolis powerhouse of the Santee-Cooper hydro-electric project, with irrigation lock shown at left.

Arkabutla Dam to be completed in October



Intake structure of outlet works under construction. Note how middle gate is at higher elevation than outer gates.

UNDER CONSTRUCTION on the Coldwater River in Tate and DeSoto counties, Miss., about nine miles southwest of Hernando, Miss., as part of a comprehensive flood control plan for the Yazoo River, the Arkabutla Dam and Reservoir project is scheduled for completion in October, 1942. The reservoir will control the runoff from 1,000 sq.mi. or 74 percent of the Coldwater River area and 15 percent of the area contributing to headwater floods above Yazoo City. About 31,500 acre-feet of storage will be provided at the conservation pool level or El. 210 and at spillway crest level or El. 239 flood control storage will be 493,800 acre-feet additional. This makes the total reservoir capacity 525,300 acre-feet. The full reservoir will extend up the valley 16 miles and have a surface area of 52 sq.mi.

The $9,985,000 Arkabutla project includes construction of a rolled fill dam; outlet works consisting of an intake tower, conduit, and stilling basin; a spillway of the chute type; improvement of the channel below the dam; and relocation of a railroad, a trunk highway, and minor local roads.

The main dam and abutment dikes will be of the earthfill type composed mainly of impervious materials such as silty loam and loess. Fill material will be obtained from the borrow areas and from required excavation for the spillway. At crest level, El. 265, the dam will be about 10,000 ft. long, not including the north ridge dikes, and will have a maximum height of 7 ft. The total fill is estimated at 4,158,000 cu.yd.

Located near the south end of the dam, the outlet works will provide a means of regulating the outflow of the reservoir storage. As shown by an accompanying illustration, the intake structure will contain three regulating gates with the middle gate at higher elevation than the other two. Discharge from these gates to the stilling basin will be by means of a concrete tunnel of inverted egg shape with a height of 18¼ ft. and a maximum width of 16 ft.

To protect the dam from being overtopped, a spillway of the chute type and with an uncontrolled crest at El. 239 will be constructed in the north abutment. The spillway will discharge 89,000 cfs. at superflood reservoir level or El. 257.

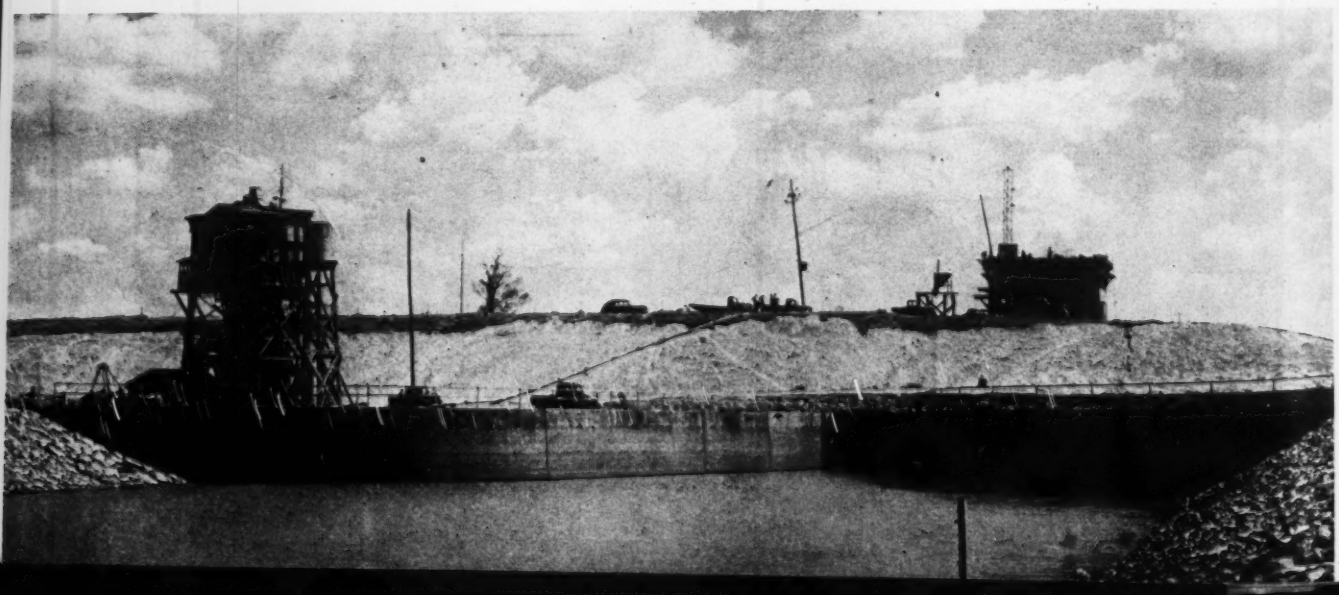
Arkabutla project, exclusive of the highway and railroad relocations, reservoir clearing, and channel improvements, is being performed under one general contract held jointly by Forcum-James Co., Pioneer Contracting Co., and H. N. Rodgers & Sons Co. Completion of the work covered by the joint contract is scheduled for October, 1942. Already completed are: stripping of the foundations and borrow areas, installation of the seepage well system, construction of the cofferdams and outlet works—except for the operating house superstructure and service bridge, and placement of the upstream sheet steel cut-off wall for the spillway.

Work well advanced includes: placement of impervious embankment, which was 75 percent complete at the start of the year; excavation for the spillway; and placement of the riprap protection on the upstream slope. Work not started includes: installation of the downstream slope drainage system for the main dam, construction of the downstream steel sheet pile cut-off wall at the spillway, and placement of the concrete slab and walls for the spillway's stilling basin.

Planning and construction of the entire project are under the direction of the president of the Mississippi River Commission, Gen. Max C. Tyler, Vicksburg, Miss., and under the immediate supervision of District Engineer Lt. Col. S. D. Sturgis, Jr., U. S. Engineer Office, Vicksburg.

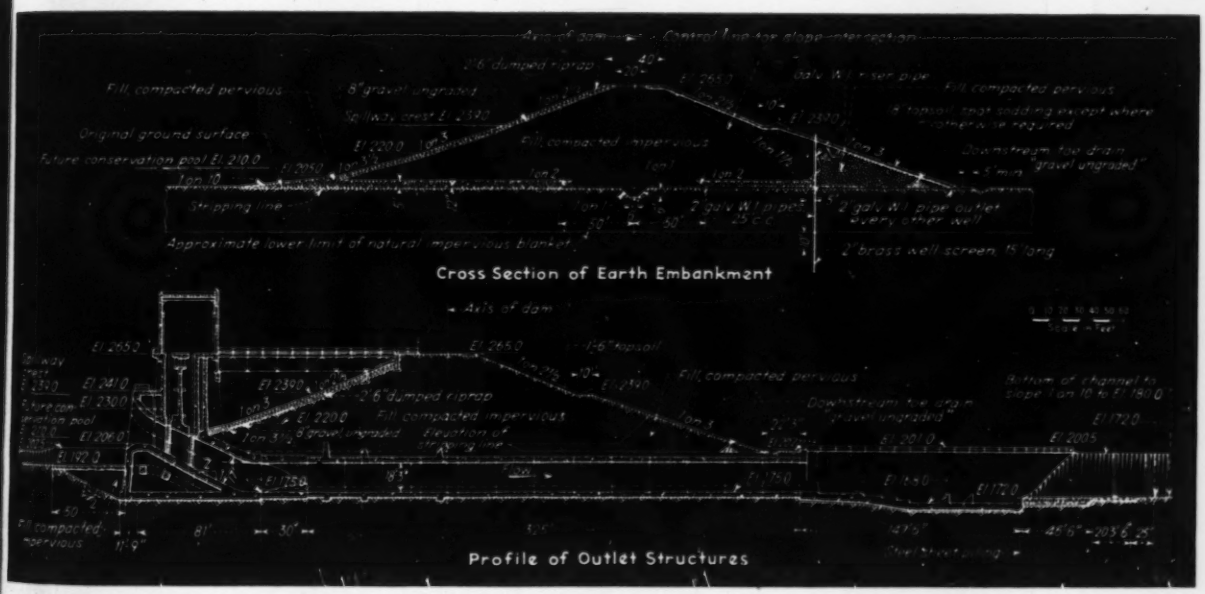
Outlet works, stilling basin and paved portion of outlet channel. River has been diverted and entire low water flow is passing through the structure. Intake structure is in background.

U. S. Engineers Photos



Construction of the closure section of the main embankment (above) is in progress in the foreground. Intake structure is under construction at the right. Although it cannot be seen, stilling basin is just this side of the concrete mixing plant at the extreme left.

Construction (above) of spillway with reinforced-concrete weir, which is near upstream end of spillway's main portion, shown at right. Weir's crest is El. 239.0 while dam's crest is El. 265.0.



At the top a typical cross section of the main earthfill embankment is given. Details of the intake, stilling basin, and connecting conduit of the outlet works are shown below.

Excessive chlorination opposed by A.W.W.A.

Modification of present practice is unnecessary. Chlorine for water treatment promised by WPB

Disapproving a general recommendation that chlorine dosages in water treatment plants be increased so that a residual amount could be carried throughout the entire distribution system, the board of directors of the American Water Works Association has passed a resolution stating that experience here and abroad does not indicate that such practice is practicable or necessary. Present procedure is to maintain chlorine residuals at the point of treatment only and not throughout the pipe system; to modify this practice, as had been suggested, would mean a vast increase in present chlorine requirements for water purification purposes.

High rating for chlorine

Chlorine shortages exist throughout the nation but the War Production Board in an announcement dated Jan. 27 said that chlorine in all forms for potable water and sewage treatment is given high preference over civilian and some war uses. High-test calcium hypochlorite and chloride of lime are presently more scarce than chlorine and sodium hypochlorite. The chemical and allied products branch of the WPB reported that it may be necessary for plants using these materials to substitute one of the latter.

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War and priorities cause shortage of burlap

War in the East is severely limiting the import of burlap from India, and the Division of Industry Operations of the War Production Board, in an effort to meet this situation, has practically cut off all supplies of new burlap bags for the construction industry. By burlap priority regulations, two-thirds of imports are set aside for Army and Navy sandbags and camouflage cloth to fill orders with an A-1-j or better priority rating, and for a stockpile being accumulated by the Defense Supplies Corp., an RFC subsidiary. The remaining third is entirely allocated to bags for agricultural use.

The situation has not yet affected the industry seriously enough to result in complaints to Washington. Thus no studies are yet underway to find possible substitutes suitable for construction use. The Agriculture Department, however, is much concerned over the problem of bagging farm crops and is trying various substitutes.

Except for those uses where paper can be substituted (and even paper is likely to be short soon) no very satisfactory substitute appears to be available to the industry. The most common substitute for burlap is osnaburg, a coarse cotton fabric. This, however, is somewhat more expensive than burlap and lacks its ruggedness and resistance to decay. Moreover, the manufacturing capacity of osnaburg mills is probably insufficient to meet much of the demand ordinarily satisfied by burlap.

Several Mexican fibres such as sisal are manufactured locally and on a small scale into fabrics with many of the desirable qualities of burlap. There is no particular scarcity of these fibres, but there is in this country almost no machinery of the specialized type required for handling fibres of this character. In the past, nearly all burlap has been woven in India and imported to this country in the form of cloth. With heavy war demands absorbing the capacity of the machine building industries, there appears little chance that the machinery needed could be provided.

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House committee holding Alaska highway hearings

Construction of a highway to Alaska, a project which has been getting desultory attention for several years, is now before Congress again, with arguments of its proponents strongly reinforced by the war in the Pacific. The House roads committee this week is holding hearings on a bill which would authorize immediate construction of the highway at a cost of $25,000,000. Choice of route and of the agency to build the road would be left up to the President.

An Alaskan highway has been under investigation for several years by the Alaskan International Highway Commission headed by Congressman Warren G. Magnuson. The State Department also has carried on preliminary negotiations with Canada as to means of financing the Canadian portions of the road. The pending legislation would permit expenditure of U. S. funds in Canadian territory.

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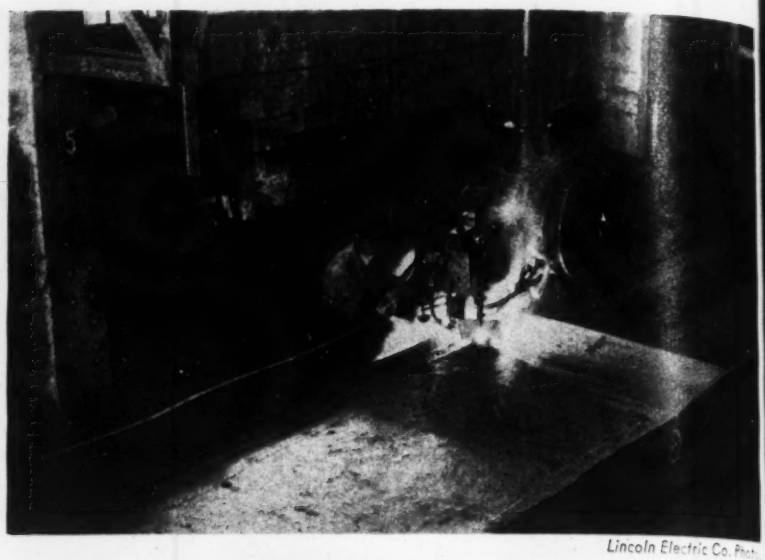
Bids asked for removing Boston elevated railway

Bids are sought by Feb. 18 (at noon, d.s.t.) by Edward Dana, president and general manager, Boston Elevated Railway, for the removal of the structure of the Atlantic Avenue division in accordance with a recent decision of the Massachusetts Supreme Court. About 10,000 tons of steel are estimated as salvage. Bidders can obtain full details at the offices of the railway, 31 St. James Avenue, Boston, Mass., and for $5 complete specifications and other assembled information can be had in proper form for use anywhere. The cost of the structure to Jan. 1, 1939, was $5,636,330, of which $2,793,548 represented property damages.



Lincoln Electric Co. Photo

Deep girders welded from plate and split H-beam

To fulfill the requirements for deep girders on a fabricating contract for the Navy Department, the Dravo Corp., Pittsburgh, Pa., developed a welding procedure for inserting the proper depth web plate between T-flanges made out of a split H-beam. With the use of an automatic carbon arc welding head, mounted on a movable and adjustable supporting post, the girders were put together at a minimum of time and cost.

The girder shown in the picture is made from a 28x⅜-in. plate and a 14-in. H section with a 12-in. flange. Other girders on this same contract were 67 in. deep and utilized split 30-in. girder beams for flanges along with a ⅞-in. web.

Canvas cover permits wet weather paving on concrete deck of Pit River Bridge

Laying the concrete deck of the Pit River Bridge on the Central Valley project in California is being carried on through the rainy months with the aid of a tarpaulin cover (*ENR*, Dec. 11, 1941, p. 839), thus avoiding serious delays on what would otherwise become a bottleneck on the Shasta Dam work.

Pit River Bridge has an overall of 3,588 ft. including short highway approach viaducts on either side, and rises to a height of about 500 ft. above the waters of the Pit River. The span will carry two railroad tracks on the lower deck and a four-lane section of U. S. Highway 99 will be carried on the upper deck.

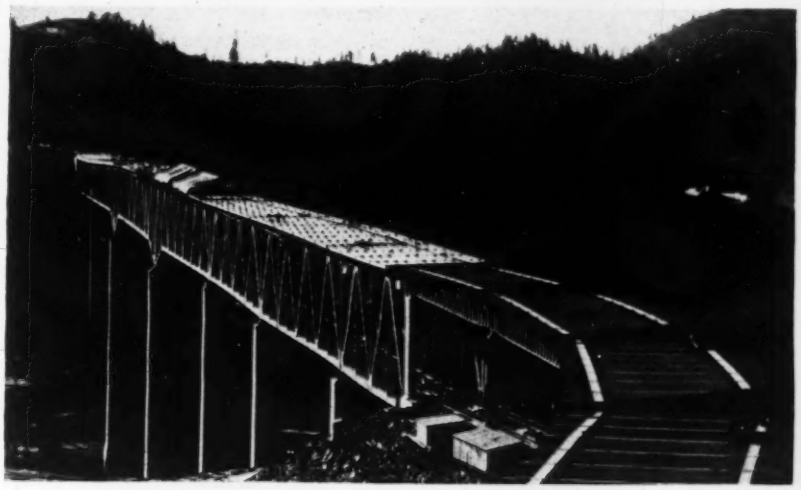
The weatherproof cover is made of canvas weighing 15 oz. per sq. yd. before treatment. It is made of 20 sections of canvas 65 ft. long and 20 ft. wide, which are moved along as the work progresses. Each section is placed with its 65-ft. length transverse to the bridge centerline and adjoining sections are overlapped one foot, giving each section an effective width of 19 ft. Thus the 20 sections cover a 380-ft. length of the bridge deck.

The canvas is supported along the bridge centerline by a ⅝-in. wire rope; the height of the canvas is maintained by 4x6-in. posts 13 ft. long set vertically under the cable 19 ft. apart. A manila rope sewn into the ridge line of the canvas has attached to it, at intervals of 6 ft. 8 in., pairs of matched hooks that ride on the wire cable. Thus the canvas has support at intervals of 6 ft. 8 in. To distribute the pull from these hooks, an "over" rope, at right angles to the center line runs from the hooks to the roadway edge. There it terminates in tackle, by means of which the canvas is drawn tight and fastened to outriggers on the bottom of the steel bridge stringers.

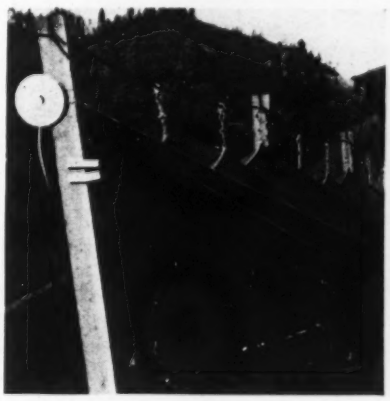
Weather protection

The 380-ft. length of canvas cover is designed to provide weather protection for three phases of work on the deck slab, namely: concrete form building, placement of reinforcing steel and concrete paving. Special sections of the canvas cover, made up for either end of the covered portion of the deck, provide means of closure that prevent wind from driving lengthwise through the long tent.

The canvas awning was supplied by the J. L. Stuart Mfg. Co., San Francisco, to Crause and Sanders, Detroit, paving subcontractors under the American Bridge Co., general contractors on the Pit River Bridge. The work is being done for the U. S. Bureau of Reclamation as part of the Central Valley project.



Pit River bridge, as seen from the north end, with canvas covering upper deck paving operations. In right foreground, deck forms for super-elevated, curved approach are not yet in place.



At intervals of 6 ft. 8 in., matched hooks provide a support for the canvas and can be slid along the cable as the canvas is moved.

At the edges, the canvas passes over a 2-in. pipe railing 5½ ft. high, is fastened to outriggers on the bottom of the stringers.

The tent extends the full width of the roadway but paving is done on only half the width at a time. Concrete mixing equipment is not housed in the tent.

MEN AND JOBS

J. Norman Pease, architect and engineer of Charlotte, N. C., who holds the rank of colonel in the Quartermaster Corps Reserve of the U. S. Army, received his orders to report for active duty on Feb. 1. He expects to be transferred to the Corps of Engineers. His firm, J. N. Pease & Co., has been engaged in construction work on army cantonments at Fort Bragg, N. C., Camp Davis, N. C., and at Paris, Tenn., the work totaling about $60,000,000. **George S. Rawlings** and **James E. Stenhouse,** associates in the firm, will carry on the business of the company.

J. A. Rowat, of Albia, Iowa, has been appointed Emmett County, Iowa engineer. He succeeds **L. L. Boggers,** who has resigned after 6 years of service.

Charles F Marten, of Hancock County, Iowa, has been reappointed county engineer.

Vernon A. Parks, superintendent of the New Lexington, Ohio waterworks system for the past 18 years, has resigned. His successor has not yet been appointed.

Robert Wager, engineer with the Ohio State Highway Department and former city manager of Sandusky, Ohio, has been appointed as service director of Bellevue, Ohio, to succeed **G. A. Williams,** who has retired after 22 years' service.

Wilson D. Lorenzen of the Emmet County engineer's office at Albia, Iowa, has accepted a position with the U. S. Geological Survey.

M. J. Cramer, of Baton Rouge, La., has been engaged as senior engineer for the Public Roads Administration in the Fort Worth, Texas office. Mr. Cramer succeeds **J. C. Carpenter.**

Lieut. Edward Jordan, assistant zone engineering officer, First Zone, has been assigned to Portland, Maine, for temporary duty as assistant to the Constructing Quartermaster of the harbor defenses of Portland.

J. B. Snape, civil engineer, has joined the staff of the Works and Buildings Department of the naval service and is stationed at Halifax, N. S. He was formerly connected with the National Parks Branch of the Department of Mines and Resources, as resident engineer, at Jasper Park, Alta.

W. M. Diggle, civil engineer, has resigned his position with the Canadian Bridge Co. at Walkerville, Ont., to join the Royal Canadian Air Force and is stationed at the School of Aeronautical Engineering at Montreal.

Neville Beaton, civil engineer, has resigned his position as resident engineer of the Powell River Co., Powell River, B. C., to accept an appointment to the consulting branch of Wartime Merchant Shipping, Ltd., at Montreal. He has been with the Powell River Co. for the past eight years, during which time he was in charge of projects and engineering developments, including the recently completed $1,000,000 Constant Angle Arch Dam at Lois River.

David R. Grissman, of Franklin, Pa., has been appointed by the Pennsylvania Highway Department to be resident engineer of District No. 1, with headquarters at Franklin.

The following changes have been made in the personnel of the Kansas State Highway Commission: **C. Frank Virr,** former assistant to the engineer of design, becomes assistant to the state highway engineer; **George E. Tiffany,** formerly engineer of Division 6, becomes engineer of construction; **Robert Willis,** former engineer of Division 4, becomes assistant engineer of design; **L. J. Siler,** former engineer of Division 2, becomes assistant engineer of maintenance; **Leslie E. Edmonds,** formerly of the information section, becomes superintendent of public relations. **H. C. Green,** formerly assistant field division engineer, Division 2, becomes assistant field division engineer of Division 1; **R. R. Ireland,** former division engineer, Division 5, becomes division engineer of Division 2; **G. A. Johnson,** formerly assistant office division engineer, Division 3, becomes assistant field division engineer of Division 2; **Donald Ward,** formerly district clerk of District 1, becomes district clerk of Division 2; **W. G. Johnson,** formerly assistant office division engineer, Division 5, becomes division engineer of Division 3; **A. J. Wandt,** former assistant field division engineer, Division 3, becomes assistant office division engineer of Division 3; **George Horning,** formerly resident engineer of Division 5, becomes assistant field division engineer of Division 3. **J. R. Cook,** former assistant engineer of maintenance for Division 4 becomes division engineer of Division 4; **L. G. Murphy,** formerly division engineer of Division 3, becomes division engineer of Division 5; **W. E. Allison,** formerly assistant office division engineer, Division 6, becomes assistant office division engineer of Division 5; **Hershel Lifors** district clerk, was transferred to District No. 2. **R. G. Porter,** formerly assistant field division engineer of Division 1, becomes division engineer of Division 6; **C. O. Barker,** formerly resident engineer, Division 1, becomes assistant office division engineer of Division 6.

C. J. "Jim" Allan, formerly of the Union Metal Company and the Pacific Union Marbelite Company, has joined the staff of Donald R. Warren, structural and civil engineer at Los Angeles.

Thomas J. Judge, airport engineer, will supervise the construction of the $500,000 Flathead County airport near Kalispell, Montana. Work is scheduled to start early in March.

Neil Brown of Estherville, previously Emmet County (Iowa) engineer, has accepted an engineering post with the Iowa State Conservation Commission.

R. F. Jones, formerly district material inspector for the Iowa State Highway Commission at Council Bluffs has been named a field engineer in the soil cement bureau of the Portland Cement Association.

R. F. Weller of Lincoln, Neb., assistant state construction engineer and former chief of the state highway patrol, has resigned to become a traffic expert for the Federal Bureau of Investigation.

Fred F. Tate of Westbury, N. Y., has been appointed Monroe County engineer with headquarters at Albia, Ia. He succeeds J. A. Rowat, who recently resigned the post to become Emmet County engineeer.

Rollin Weir, of Denver, Colo., formerly an engineer for the Colorado State Highway Department, has resigned his post to accept a position with the U. S. Army Engineers at Nome, Alaska.

W. A. Wade, formerly of the Tipton Engineering Co., of Denver, Colo., has joined Wilson and Co., engineering consultants on the U. S. Army's Pueblo, Colo., Munition Dump Project.

H. M. Ford has been appointed Wisconsin state director of the public works reserve to succeed Leo J. Voell. Mr. Ford will make his headquarters at Madison, Wis.

J. B. Cutchin, formerly district engineer at Washington, N. C., for the North Carolina Highway and Public Works Commission, has been named to succeed the late Roy J. Hart as district engineer at New Bern, N. C. **John Gilbert,** resident engineer at Washington has been named district engineer there.

Wood preservers consider effective uses of lumber for defense program

Possible shortage of creosote, with resulting use of available substitutes, and other problems, discussed at Minneapolis meeting.

The effect of war-time conditions upon the production of treated lumber was carefully scrutinized by more than 200 members of the American Wood-Preservers Association at the organization's 38th annual convention Jan. 27 to 29 in Minneapolis. With existing 1942 orders indicating that the output of treated lumber for both new and customary usage must be considerably increased, the government officials, technologists and executives attending focussed attention upon: (1) effect of priorities on basic chemicals used in present preservatives; (2) development of new preservatives; (3) simplification of specifications for fireproofed lumber; and (4) ways by which preservatively-treated lumber can be used as a substitute for structural steel and other limited construction metals.

Possible preservative shortage

The availability of salt preservatives and creosote may be seriously affected during the coming year, with creosote shortages being the most acute, according to George M. Hunt, chief, wood-preservation section, U. S. Forest Products Laboratory, Madison, Wis. "The amount of creosote produced from domestic sources in 1942 for wood-preservation will considerably exceed the domestic production in 1941, but we enter 1942 with much lower stocks than at the start of the preceding year when treating plant operators and producers had approixmately 30 to 40 million gallons in storage," Mr. Hunt told the association.

"It does not seem likely, however," Mr. Hunt continued, "that domestic production alone, even when accelerated to the extent that may be reasonably expected, can supply all the creosote needed."

Should a creosote shortage result, Mr. Hunt said, petroleum solutions of pentachlorphenol and tetrachlorphenol can be used as effective toxic preservatives. These materials appear to be available during 1942 in any quantity that may be needed for wood-preservation.

No lumber price rise expected

Treating plant operators will have little trouble in 1942 securing lumber from local suppliers, W. A. Summerhays, war production board official and former OPM consultant, declared. No change in the present price structure of lumber for the next three or four months is predicted, he said. It was explained that the government's recent order for 750 million bd. ft. of lumber was placed with over 800 suppliers and will not work a hardship on any buyer.

Mr. Summerhays forecast increased demand for government use of treated material in piling and in lumber for docks, piers, warehouses, munitions plants, extensive housing projects and building of the school and hospital type.

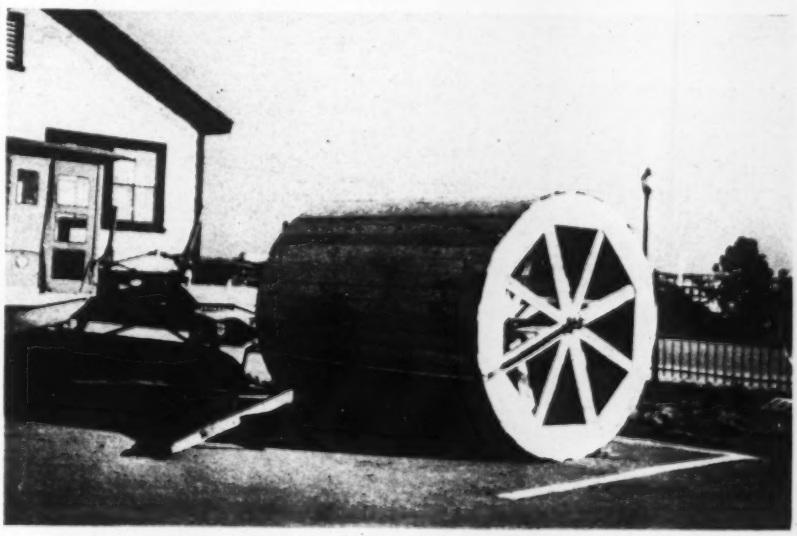
A growing need for wood-preservers to supply pressure-impregnated, fireproofed lumber to safeguard industries from fire hazards arising from sabotage, use of additional welding equipment, inexperienced workers, adaptation of plant facilities for manufacturing new products, and possible incendiary bombing was recognized by L. K. Andrews of New York, technical representative of the American Lumber & Treating Co.

Mr. Andrews urged that present fireproofing specifications, which define product performance, be changed to govern composition and retention of fireproofing agents, whereby a finished product with known characteristics results. His recommendations for definite retentions with approved agents, based on laboratory tests, asked changes that would allow wood-preservers to supply fireproofed lumber for use in ordnance plants, aircraft hangars, supply depots, freight houses, bridges, garages, manufacturing plants, etc., where fire hazards arise.

Fireproofing chemicals, although more corrosive than wood-preserving salts, will not seriously damage metal fastenings, Arthur Van Kleeck, association chemist, U. S. Forest Products Laboratory, reported.

A new salt preservative developed for poles, by engineers of the Bell Telephone Laboratories was described by engineers of that organization. Poles treated with the new preservative were recommended for urban lines where cleanliness is a requirement.

Bernard Blum, chief engineer, Northern Pacific R. R. reported that heavily treated creosote fir piling in *teredo* and *Limnoria* infested tide waters of the Pacific Coast indicated an average pile life in excess of 30 years, one test installation now 40 to 50 years old showing no deterioration. In contrast untreated fir piles



Roller used to pack snow at Pittsburgh airport

New application of an old principle is the use of the light weight roller shown above to pack the snow on the runways of the Allegheny County (Pittsburgh, Pa.) Airport, presenting a smooth firm surface on which planes may land or take off. The roller is 8 ft. diam., 10 ft. long, and weighs about 1000 lb. It is built around five circular wooden frames which turn on a 2-in. pipe axle. A light steel frame connects the axle to a wooden hauling tongue. Outside lagging is made of 1x4 board. The ends of the roller were closed, after the first use, to prevent snow accumulating inside.

According to Twing Brooks, manager of the airport, the roller has proven entirely satisfactory on its one use to date. Pulled by a light truck at normal speed it reduced the depth of snow from 6½ to 2 in. at one pass, and made a firm surface free from ruts. As the snow melted the roller was again pulled over uneven spots or ruts left by plane wheels and satisfactorily smoothed the surface. Users say that the roller appears to be about the best size and weight and should be of value to fields with limited snow handling budgets where removal of the snow is not contemp'ated.

in the Puget Sound waters practically disappear from *teredo* action in 3 to 5 years. Northern Pacific records indicate that during the past 12 years, 11.5 percent of the untreated ties were renewed annually, but only 3.9 percent of the treated ties. Mr. Blum considered the 66 percent reduction in annual cross tie renewals due to a large extent to creosote treatment.

A paper by W. J. Burton, assistant to the chief engineer, Missouri Pacific R. R. would indicate that gum ties when properly handled and treated give excellent service. The gums have the peculiar characteristic of being easily infected, and when they came into large use about 1918 there were many failures, generally characterized by the decay in the center, leaving shells of treated wood, and to all appearance a perfect tie. It was the writer's opinion that lack of attention to proper detail in handling was responsible for the black eye given the gum ties rather than an inherent fault of the wood. Gum ties must be cut and manufactured in winter months when there is less chance for infection while in the woods, and they must be moved quickly in open cars to the treating plant.

New officers elected

Enroute to Minneapolis by special train from Chicago, association members stopped at Madison, Wis., to confer with heads of the Forest Products Laboratory on the use of treated lumber to alleviate metal shortages. Members also witnessed several demonstrations of the action of chemicals used in incendiary bombs on non-fireproofed lumber.

W. P. Conyers, Taylor-Colquitt Co., Spartanburg, S. C., was elected president for the coming year to succeed W. R. Goodwin, St. Paul & Saulte Ste Marie Ry., St. Paul, Minn. Other officers named include: R. H. Colley, Bell Telephone Laboratories, New York, first vice president; W. P. Arnold, Wood Preserving Division, Koppers Co., Orville, Ohio, second vice president; and H. L. Dawson, Washington, D. C., secretary-treasurer.

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Robins, Somervell and McCoach promoted

Among a group of high-ranking Army officers nominated for promotion last week by the President appeared the names of three well known engineer officers. Promotions to major general were recommended for Brig. Gen. Thomas M. Robins, assistant to the Chief of Engineers, and for Brig. Gen. Brehon B. Somervell, chief of supply on the Army General Staff. Recommended for promotion to brigadier general was Col. David McCoach, Jr., executive officer in the office of the Chief of Engineers.

CIO construction union encountering obstacles

War and the pre-war defense program have very nearly eliminated the CIO's Construction Workers Organizing Committee from the construction field. In order to avoid trouble the government has followed the policy of giving preference to the AFL on war work; the CIO has obtained only a few scraps here and there. And with private construction almost disappearing, the UCWOC finds itself pretty well squeezed out of the picture. Especially since the Currier case, in which a CIO contractor had his low bid on a housing project rejected, both contractors and workers have felt considerable hesitation in going along with a union which is out of favor with the government.

This does not mean that UCWOC is folding up. In fact its membership is said to be at a high point of something like 50,000. But it has changed its field, is concentrating on organization of plants manufacturing construction materials and on building service workers. If it can outlast the war, the union hopes to have achieved enough strength in the building supply field to be in a favorable position to come back into construction.

Continued existence of the UCWOC as an independent entity is somewhat dependent on outside factors. The union is the creation of John L. Lewis of the Mine Workers, is hated by the AFL and rather disapproved of by many CIO people. For the present Lewis is playing a lone hand. If he decides to join forces with either the AFL or the majority group in the CIO, the UCWOC might become a liability.

Meanwhile, the union is keeping a toehold in the house-building field by promoting a scheme in which it offers the facilities of the CIO industrial union council in a particular city to aid in the sale of "low-cost" privately-built houses to CIO workers in return for use of CIO labor in building the houses. The most successful of such schemes to date is at Cleveland where the first of several hundred houses is now being built. The union hopes to get some work out of the scheme for cooperative houses now being worked out by the housing coordinator.

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Bion J. Arnold, dies; Chicago transit engineer

Bion J. Arnold, noted Chicago engineer and transit expert, died in that city Jan. 29 at the age of 80. Col. Arnold was chairman of the board of supervising engineers, Chicago Traction, a position he held for 35 years. He became a consulting engineer in 1893, serving many cities as a transit engineer, and was active in the pioneering of railroad electrification, including that of the New York Central at New York. His intramural railroad at the Chicago World's Fair in 1893 was the first third-rail installation in the country.

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General Patrick dies, Army engineer and airman

Maj. Gen. Mason M. Patrick, 78, retired, first chief of the Army Air Service and well known as a civil engineer, died in Washington, D. C., Jan. 29.

A graduate of West Point in the class of 1886, General Patrick served continuously in the Corps of Engineers, until his selection to head the Army air service in France in 1918. This service included assignment as chief engineer of Army of Cuban Pacification in charge of road and map work from 1906 to 1909, membership on the board that developed the now-famous cofferdam for use in raising the battleship Maine, and long service on Mississippi River control work. He also served as an instructor in practical engineering at West Point.

General Patrick went to France in 1917, first becoming Chief Engineer of the Lines of Communication and later Director of the Division of Construction and Forestry. It was from this position that he was selected by General Pershing to take charge of the air force of the A.E.F. because of his organizing ability.

Following his return to this country, General Patrick was made Chief of the Army Air Corps in 1921, retiring in 1929. Subsequently he was appointed Public Utility Commissioner, D. of C.

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War damage clause put in airport specifications

The Seattle district office of the U. S. Engineers last week inserted a war damage clause for the first time in their specifications for airport work.

The war-time clause reads as follows: "It is expressly understood and agreed that the contractor shall not be liable for damage to or destruction of the work or any part of the work covered by this contract resulting from enemy operations. In the event the work covered by this contract is damaged due to enemy operations, the contractor shall, if so ordered by the contracting officer, repair such damage under a change order stipulating the additional sum to be added to the contract price and the additional time for performance. In the event the work covered by this contract is destroyed or damaged due to enemy operations and the government decides not to replace or repair such work, the contractor shall be paid all costs reasonably incurred in connection with the prosecution of the work."

OBITUARY

JOSEPH C. HILTON, 69, of Larchmont, N. Y., for the past three years project engineer for the Public Works Administration in the construction of the Belt Parkway in Brooklyn and Queens, N. Y., died Jan. 30 at New Rochelle, N. Y.

ARTHUR H. PRATT, chief hydraulic engineer of the Public Service Commission of New York, died at South Orange, N. J. Feb. 1. He was 67 years old. Before joining the Public Service Commission about ten years ago, Mr. Pratt was designing engineer for the North Jersey District Water Supply Commission, and in the first World War he served in France as a major with the 26th Engineers.

ROY JACKSON HART, 52, of New Bern, N. C., district engineer for the North Carolina Highway and Public Works Commission, died at Fayetteville, N. C., Jan. 23.

PAUL SINGER, 50, widely known construction engineer, died Jan. 18 at his home in Springfield, Ohio. Mr. Singer was a partner in the Hodges-Singer Construction Co.

JOHN BLACKWOOD MARTIN, 54, an engineer for the Canadian National Railways since 1919, died at Montreal Jan. 14.

BERTRAM L. DORMAN, 68, Vancouver, B. C. city engineer and Clark County engineer, died at Vancouver Jan. 9.

ALEXANDER J. ISBESTER, 62, pioneer railway construction engineer, died at his home at Port Arthur, Ont., Jan. 25.

JOHN A. MACDONALD, 57, a civil engineer employed by the Hydro Electric Power Commission, of Ontario, Canada, died Jan. 9 of drowning. A native of Ontario, Mr. MacDonald was at work on a hydrographic survey of the tailrace of the DeCew Falls power station.

JAMES W. LEE, 70, retired structural engineer of Somerville, N. J., died at his home Jan. 25.

GUY R. CAMPBELL, 61, assistant county engineer of Palo Alto County, Iowa, died at his home in Emmetsburg, Iowa, recently.

HAROLD R. PASKETT, 47, engineer for the Westchester County, N. Y. Engineer's Office, died Jan. 22 at Eastview, N. Y.

FRED W. KLINGMAN, SR., 62, for 20 years superintendent of the Middlefield, Ohio, waterworks, died at his home in Middlefield on Jan. 18. He had retired from the post of superintendent last September.

THOMAS J. BROWN, 86, engineer and general contractor of Montreal, Canada, died at his home in Montreal Jan. 24. During his long career, Mr. Brown was superintendent of construction on three sections of the Soulanges Canal and general construction superintendent for the New York Tunnel Co. and the Interborough Rapid Transit Co., New York.

MAXWELL STEPHEN, 45, formerly a structural steel engineer for the Consolidated Edison Co., died Jan. 31 in New York.

THOMAS BENTLEY, 68, president of A. Bentley & Sons contractors, died Feb. 1 at his home near Perrysburg, Ohio. Mr. Bentley, was construction assistant with the 6th Army Corps.

WALTER E. TRENT, 58, mining consultant and engineer, died Jan. 19 at Washington, D. C.

SAMUEL LOCKWOOD, 80, retired building contractor of Haverhill, Mass., died at his home there on Jan. 26.

THOMAS M. HATCH, 67, a retired road building contractor of Akron, Ohio, died at Cleveland on Jan. 23.

JOHN FOLEY, road contractor of Ottawa, Canada, died Jan. 20 at the age of 81. He was recently manager of the Ontario division of the Standard Paving & Materials, Ltd.

ARTHUR G. GORDON, 66, senior highway bridge engineer of the Bureau of Public Roads died Jan. 29 at Takoma Park, Md.

CONTRACTS AND CAPITAL

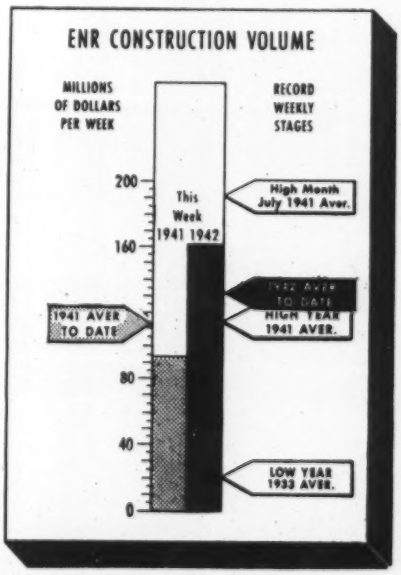
HEAVY ENGINEERING construction for the week totals $161,090,000, an increase of 72 percent over the volume for the corresponding 1941 week, but 27 percent lower than the 1942 high of a week ago. Public construction is 198 percent higher, almost triple the 1941-week total, but is 32 percent below last week. The private volume is up 26 percent compared with a week ago, but is 54 percent below a year ago.

The current week's volume brings 1942 construction to $789,870,000, a 16½ percent increase over the six-week 1941 total. Private construction, $72,768,000, is 67 percent below the period last year, but public work, $717,102,000, is 57 percent higher as a result of the 110 percent gain in federal construction.

In the classified construction groups, gains over the 1941-week totals are reported in bridges, public buildings, and unclassified construction. Industrial building is the only class of work to record a gain over a week ago.

New capital for construction purposes for the week totals $2,424,000. This volume compares with $7,576,000 reported for the week last year. The current week's financing is made up of $2,395,000 in state and municipal bond sales, and $29,000 in RFC loans for public improvements.

New construction financing for the year to date, $562,338,000, tops the $101,564,000 reported for the six-week period last year by 454 percent.



CONTRACTS

(Thousands of dollars)

	Week Ending Feb. 6 1941	Jan. 29 1942	Feb. 5 1942
Federal	$23,462	$187,231	$129,900
State & Municipal	23,328	17,307	9,543
Total public	$46,790	$204,538	$139,443
Total private	46,951	17,156	21,647
TOTALS	$93,741	$221,694	$161,090
Cumulative 1942 (6 weeks)			$789,870
1941 (6 weeks)			$678,290

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1941 6 weeks	1942 6 weeks
NON-FEDERAL	$101,564	$112,338
Corp. Securities	37,065	24,565
State & Mun.	50,836	76,444
U.S.H.A. loans	12,043	.....
R.F.C. loans	1,620	11,329
FEDERAL	.....	$450,000
TOTAL CAPITAL	$101,564	$562,338

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Jan. '42	267.63	128.65
Building Cost	Jan. '42	217.12	117.37
Volume	Dec. '41	217	95

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

SPOKANE STREET VIADUCT
SEATTLE, WASHINGTON

OWNER: Washington State Highway Department, Olympia, Wash.; B. Bantz, state highway director.

PROJECT: Construction of a steel, reinforced concrete and timber overcrossing structure and approach ramps, Spokane St., Seattle, Wash. Viaduct to have concrete deck. Approximate length 0.8 miles. Alternate was allowed for creosoted timber or concrete approaches. Contract awarded on basis of latter.

CONDITIONS: Contractor to furnish all materials and complete work in 360 calendar days. Rail, highway and water transportation facilities available. Wage rates are: skilled labor, $2.00 per hr.; semi-skilled, $1.50; and common, $1.10.

BIDS: Four bids were received December 23, 1941, on the concrete approach basis, ranging from the contract low of $968,855 to $1,163,523. Two bids were opened on the timber approach alternate, $1,008,829 and $1,010,700.

LIST OF BIDDERS:

1. MacRae Brothers, Seattle, Wash. (contract) $968,855
2. Erickson Paving Co., and H. Hagman, Seattle, Wash.
   (concrete approach) 1,039,750
   (timber approach) 1,010,700
3. Macri & Mullen, Seattle, Wash. (concrete approach) 1,111,143
   (timber approach) 1,008,829
4. Western Construction Co., Seattle, Wash 1,163,523

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Structure excavation	6,900 c. y.	$3.35	$4.00	$5.00
2. Furn. timber piling (untr.)	69,300 l. f.	.23	.25	.25
3. Drive untr. timber piles	1,554 ea.	11.50	12.00	11.88
4. Furn. timber piling (creosoted)	18,900 l. f.	.72	.67	.88
5. Drive creosoted timber piles	427 ea.	11.00	13.00	15.62
6. Timber and lumber (untr.)	355 M bm.	74.00	70.00	87.50
7. Timber and lumber (creosoted)	33 M bm.	103.00	110.00	137.50
8. Steel railroad rails (used)	8,700 lb.	.0325	.12	.065
9. Earth fill in appr. ramps	5,200 c. y.	.85	1.25	1.88
10. Remove exist. concr. pavement	425 s. y.	1.00	1.00	1.25
11. Remove exist. concr. curbs	1,890 l. f.	.25	.55	.63
12. Class D excav., incl. bkfill	740 c. y.	1.45	5.00	1.88
13. 12-in. vitr. clay sewer pipe	154 l. f.	1.80	1.50	1.88
14. 15-in. vitr. clay sewer pipe	88 l. f.	2.10	2.00	2.19
15. 21-in. vitr. clay sewer pipe	281 l. f.	3.85	3.25	3.13
16. 27-in. vitr. clay sewer pipe	283 l. f.	7.00	6.00	6.25
17. Sew. manholes with exist. ring and cover	2 ea.	95.00	150.00	143.75
18. Sewer manholes	11 ea.	120.00	200.00	162.50
19. 6-in. vitr. clay sewer pipe	120 l. f.	1.50	1.00	1.57
20. Class A conc. (struct. and deck steel spans)	8,740 c. y.	29.00	30.00	30.00
21. Class A conc. (deck on timber spans)	919 c. y.	32.00	30.00	29.00
22. Concrete Class B	407 c. y.	26.00	30.00	29.00
23. Class C concrete	34 c. y.	25.00	30.00	31.25
24. Class F concrete	720 c. y.	24.00	30.00	27.50
25. Cem. conc. pavmt. std. 14-day mix (10-7-10-in.)	2,060 s. y.	2.70	2.00	4.38
26. Cem. conc. pavmt. std. 14-day mix (8-in.)	3,260 s. y.	2.00	2.50	3.44
27. Type A curbs	3,140 l. f.	.50	1.75	1.88
28. Extra for furn. H. E. S. cem. in place of standard	720 bbl.	.60	.70	.75
29. Dowel bars without caps (std.)	1,620 ea.	.20	.22	.38
30. Dowel bars with caps (std.)	740 ea.	.30	.30	.44
31. Steel reinforcing bars	2,844,000 lb.	.05	.055	.0675
32. Struct. steel	2,376,800 lb.	.08	.095	.09
33. Cast steel	25,700 lb.	.25	.30	.45
34. Forged steel	11,100 lb.	.35		.45
35. Trolley protect. and gd. fence	L.S.	1,110.00	1,500.00	1,500.00
36. Locomotive blast protection	L.S.	1,177.00	1,200.00	1,500.00
37. Bridge drains	56 ea.	30.00	60.00	75.00
38. Downspouts	1,400 l. f.	4.10	2.00	2.50
39. Lighting system	L.S.	38,450.00	32,000.00	34,314.00
40. Precast white center curb	1,450 l. f.	2.25	2.25	1.25
41. Catch basin and inlet	L.S.	150.00	150.00	250.00

Schedule A—Four Side Ramps—Concrete

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Structure excavation	2,300 c. y.	$3.50	$4.00	$5.00
2. Furn. timber piling (untr.)	13,000 l. f.	.23	.22	.25
3. Driving timber piles (untr.)	336 ea.	11.00	12.00	11.88
4. Earth fill in side appr. ramps	3,200 c. y.	.85	1.25	1.88
5. Class A concrete	1,940 c. y.	31.00	30.00	29.00
6. Class F concrete	280 c. y.	24.00	30.00	28.00
7. Cem. conc. pavmt. std. 14-day mix, 10-7-10-in.	1,920 s. y.	2.70	2.00	4.38
8. Extra for furn. H. E. S. cem. in place of std.	180 bbl.	.60	.70	.75
9. Dowel bars without caps (std.)	510 ea.	.20	.22	.38
10. Dowel bars with caps (std.)	280 ea.	.30	.27	.44
11. Steel reinforcing bars	631,000 lb.	.05	.055	.0675
12. Structural steel	68,400 lb.	.07	.0925	.11
13. Forged steel	850 lb.	.25	.50	.45
14. Bridge drains	16 ea.	30.00	60.00	75.00
15. Downspouts	310 l. f.	5.00	2.00	2.50

Schedule B—Four Side Ramps—Timbers

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Structure excavation	150 c. y.	.....	$3.00	$5.00
2. Furn. timber piling (creosoted)	19,300 l. f.	.....	.92	.88
3. Driving timber piles (creosoted)	335 ea.	.....	12.00	15.62
4. Steel railroad rails (used)	21,900 lb.	.....	.12	.065
5. Earth fill in approach ramps	1,620 c. y.	.....	1.25	1.88
6. Class A concrete	765 c. y.	.....	30.00	29.00
7. Class C concrete	65 c. y.	.....	30.00	31.25
8. Cem. conc. pavmt. std. 14-day mix, 10-7-10-in.	1,675 s. y.	.....	2.00	4.38
9. Extra for furn. H. E. S. cem. in place of standard	70 bbl.	.....	.70	.75
10. Dowel bars without caps (std.)	510 ea.	.....	.22	.38
11. Dowel bars with caps (std.)	280 ea.	.....	.27	.44
12. Steel reinforcing bars	153,000 lb.	.....	.055	.0675
13. Struct. steel	68,400 lb.	.....	.0925	.11
14. Forged steel	6,290 lb.	.....	.50	.45
15. Bridge drains	16 ea.	.....	60.00	75.00
16. Downspouts	310 l. f.	.....	2.00	2.50
17. Timber and lumber (treated)	250 M bm.	.....	120.00	137.50

MOVING TARGET RANGE
LAS VEGAS, NEVADA

OWNER: War Department, Army Air Corps, Washington, D.-C.; U. S. Engineer Office, Los Angeles, Calif. Col. Edwin C. Kelton, District Engineer.

PROJECT: Constructing moving target ranges and appurtenant facilities within the Government Reservation at Sheep Mountain Area, north of Las Vegas Airport, Las Vegas, Nev. Includes all necessary excavation, filling and grading; concrete work; laying track; surfacing and paving; and other miscellaneous items of work.

CONDITIONS: Government to furnish rails and rail accessories, new ties, anti-creepers, guard rail posts complete, gauge rods, target cars, car stopping devices, and gun mounts. Contractor to furnish all other material, and complete all work in 60 calendar days. Railroad and transportation facilities available. Wage rates are: $1.25 to $1.50 per hr.; semi-skilled, 62½c. to $1.00; and common labor, 62½c.

BIDS: Seven bids were opened November 17, 1941, ranging from the contract low of $89,968 to $122,548.

LIST OF BIDDERS:

1. Gibbons & Reed Co., Salt Lake City, Utah $89,968
2. Dodge Constr., Inc., Fallon, Nev. 96,591
3. Clifford C. Bong, Temple City, Calif 97,206
4. W. R. Shriver, Glendale, Calif 110,686
5. H. B. Nicholson, Los Angeles, Calif. 115,754
6. Ralph O. Dixson, Glendale, Calif 116,826
7. Werner & Webb, Los Angeles, Calif 122,548

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Grading	54,000 c. y.	$0.35	$0.35	$0.23
2. Construct drainage ditches	14,000 l. f.	.15	.10	.23
3. Furn. and place ballast, and place track furn. by govt	21,800 l. f.	.70	.90	1.707
4. Place guard rails with posts and braces, furn. by govt	4,800 l. f.	2.55	2.50	1.29
5. Concrete for guard rail footings	1,536 c. y.	20.00	22.00	18.96
6. Asphalt paving on firing line	920 s. y.	1.45	1.00	.85
7. Embankment surface treatment	64,440 s. y.	.10	.09	.09
8. Place gun mounts furn. by govt	20 ea.	35.00	50.00	28.40
9. Install car-stopping devices furn. by govt., and furn. and inst. pipe, wire, and levers	5 ea.	250.00	500.00	193.00
10. 18-in. corr. metal culverts	60 l. f.	5.00	3.00	4.40
11. 24-in. corr. metal culverts	120 l. f.	6.00	4.00	5.58